Utah Division of Air Quality Fiscal Year 2015 Research Program

Main Goals

1. **Protect, Maintain, and Improve Public Health**
2. **Improve Capacity to Respond to Regulatory Responsibilities**
3. **Improve Inspection and Compliance with New and Existing Pollution Control Programs**

The primary goal of all air pollution regulation is in service to public health. National Ambient Air Quality Standards (NAAQS) are based upon peer reviewed health studies and the federal and state rules that are put in place to reduce pollution are directly related to maintaining basic levels of air quality as defined by the NAAQS. The Utah Division of Air Quality (DAQ) intends to initiate a research program to improve the scientific tools used to assess the causes of air pollution as well as improve the programs that have been put in place to address those causes. This is the most effective way for DAQ to fulfill its role as a regulatory agency and at the same time work to consistently improve the air quality and health of all of the citizens in the state of Utah.

Utah's air quality is a function of three things: source emissions, atmospheric chemistry, and meteorology. Ozone and most of the $PM_{2.5}$, both problematic in Utah, are formed in the atmosphere from precursor gases. Meteorology can trap these precursor gases leading to enhanced chemical formation and high pollutant concentrations. This process can lead to exceedances of the NAAQS. Understanding the roles atmospheric chemistry and meteorology play in pollution formation is critical to developing prescriptive, effective, and appropriate air mitigation plans and to provide justification to the regulated public for the control strategies needed to bring an area into attainment of the NAAQS. This information is also important to the State for maintaining primacy over the air program and prevents the EPA from stepping in and regulating through implementation of national default strategies that likely would be ineffective for Utah's unique setting. The Utah State legislature approved $1,000,000 in one-time funding to address air quality research for fiscal year 2015. In keeping with the legislature's and the citizens' desire to make tangible progress on this issue, DAQ will be seeking projects that can be completed in a six- to eighteen-month time frame.

Main Research Areas

DAQ has identified six general research topics for the Air Quality Research Program for fiscal year 2015. Please use the six research topics discussed below as a guide for input to specific research questions.

- **Improved Emissions Inventories for Precursors to Ozone and $PM_{2.5}$ Formation**

  Rationale: Source emissions are the fundamental input to air quality models. Inaccuracy in the inventory translates to errors in the modeled source apportionment of the reductions needed to meet regulatory standards. It is important to understand the appropriate activity data, emissions factors, and speciation underlying the inventory. Emissions inventories are especially weak for the oil and gas sector, limiting control work in the Uinta Basin.

- **Air Quality Modeling Improvement**

  Rationale: Ozone and $PM_{2.5}$ pollution involve atmospheric chemical reactions among a variety of different pollutants and sources. The route to cleaner air, and thus a healthier environment, lies in controlling the sources of emissions that drive these chemical reactions. The photochemical air quality modeling system is the best tool that is available for this type of analysis, however, mountain topography and the stable air masses that develop in the Intermountain West during the winter require significant modifications to the some of the underlying model components, including atmospheric chemistry.

- **Long Range Transport of Dust and Smoke from Wildfires**

  Rationale: Transport of wind-blown dust and smoke from wildfires, primarily during the spring and summer, from regions in the Western US can cause exceedences of the $PM_{2.5}$ and ozone NAAQS. Modeling tools that provide a means of quantitative source apportionment are needed to provide an effective demonstration of this effect to EPA.

- **Continuous Improvement in Compliance With DAQ SIP Control Strategies**

  Rationale: The legislature has also provided additional funding to increase the number of DAQ compliance inspectors. Because of the limited number of staff and the large number of potential inspection sites it is important to prioritize these resources. Compliance is important to ensure that air quality benefits are achieved as planned for in the SIP.

- **Ambient Air Monitoring Network**

  Rationale: The precision required for analyzing the various species of pollution makes day-to-day monitoring as well as specialized studies done to target specific compounds very expensive. Special monitoring studies for rural ozone that have been done recently by DAQ have provided insight into possible transport patterns and potential upwind and downwind locations for

pollution concentrations. Research is needed to understand the sources and apportionment to ambient as well as hot-spot air pollution levels.

- **Engineering Review of Reasonable Available Control Technology/Best Available Control Technology (RACT/BACT) for Industrial Sources**
  Rationale: Understanding the technologies that define RACT and BACT is important to ensure that appropriate controls are incorporated into the permitting process. These levels of control change with industry and over time as technologies change. Research is needed to help define the current controls available for various industries.